Effects of Acetaminophen (Paracetamol) on vasogenic brain edema and blood – brain barrier disruption in experimental model of transient focal cerebral ischemia in rats

Abstract

Background & objective: *Ischemic stroke as third leading cause of death and disability in the most of the human communities has complicated pathophysiology and there is no effective treatment against it. Inflammation and oxidative stress are most important pathophysiological mechanisms in ischemic stroke and subsequent development of brain edema. We examined the effects of post-ischemic treatment with acetaminophen on cerebral infarction, sensorimotor dysfunctions, formation of edema and blood - brain disruption in a rat model of ischemic stroke.*

methods: *Male Sprague-Dawley rats were divided into three main groups (n=16), sham, control ischemic, acetaminophen treated (400 mg/kg) ischemic groups. Transient focal cerebral ischemia was induced by 60-min-long occlusion of the left middle cerebral artery followed by 24-h-long reperfusion. Sensorimotor dysfunctions was evaluated at the end of the reperfusion period. Thereafter, the animals were randomly used for measurement of the infarct volumes and investigation of ischemic brain edema formation using a wet/dry method. Blood – brain barrier permeability was assessed by Evans blue extravasation technique.*

Results: *Induction of cerebral ischemia in the control group produced considerable brain infarction in conjunction with severely impaired sensorimotor functions. treatment with acetaminophen significantly reduced the infarct volume and improved the above functions. The water content and EB concentration in the left (lesioned) hemisphere were considerably elevated in the control ischemic group. Acetaminophen significantly lowered the water content and protected BBB integrity in the ischemic lesioned hemisphere.*

Conclusion: *Post – ischemic treatment with acetaminophen can noticeably decrease ischemic brain injury, improve sensorimotor dysfunctions and attenuate edema formation likely via protecting BBB integrity.*

Keywords: *Stroke, brain edema, BBB, acetaminophen, rat.*